

TO: FCC Commissioners

RE: Comments by Steve Waterman

"Advancement of the Radio art: One of the most touted reasons for the existence of Amateur radio is the experimentation with the radio art. As the world moves into more complex, efficient, and higher speed protocols, the Amateur service will be viewed as antiquated if it does not also produce such protocols, and operations that support them. In year 2000, when speaking at AMRAD1 about the The Future of Amateur Radio and specifically, Digital Techniques, Dale Hatfield, the former FCC Chief of Engineering and Technology, stated; "provides the opportunity or headroom for increases in data rates to more closely match those available on wireline networks and, in the future, on commercial wireless networks as well," and he goes on to quote: "as the rest of the telecommunications world makes the transition to digital techniques - and there are very few exceptions to that trend - the amateur service will look antiquated if it is not making progress in that direction as well. Mr. Hatfield's vision was obviously accurate, and is certainly amplified today as we move into a world that is either wired or wireless and the Amateur service is certainly no exception. The issue today, and for the future, is that the most efficient high speed digital data transfer protocols with the smallest relative footprint, use a bandwidth over 500 Hz, are generally under local or remote control (semi-automatic,) and are therefore constrained by Part 97.221. These narrow bandwidth segments listed in Part 97.221(b),² which contain stations over 500 Hz under local or remote control, are extremely limiting, and there is literally no room for current operations, much less for future digital enhancements to the radio art. Further limiting their availability by limiting their bandwidth to less than is currently authorized, and continuing to restrict the spaces in which they operate, is certainly not consistent with the future development of such protocols. "

The HF sub-bands do not have enough spectrum space available to reach wireline data speeds while maintaining enough operating space for the number of amateurs wishing to use the space, at least not by using the simple expansion of OFDM signals with additional carriers.

What is notable in this statement is that the automatic stations that need more space are so poorly designed that they could find sufficient operating space merely by introducing efficient system design. By eliminating "killer" trunks, by utilizing fully automatic operation during idle periods, and by moving from Erlang B system design to Erlang C the systems could potentially increase their traffic capacity by an order of magnitude.

Allowing these systems to expand their operating space would be rewarding inefficient operation. Until documented proof is provided showing how these systems have moved to implementing known engineering principles of efficient design, expansion of space should not be allowed.

"Mr. Miller suggests that Pactor 3, with a maximum bandwidth of 2.4 KHz, is unsuitable for the Amateur service, and suggests that it was developed for Commercial operations. Nothing could be further from the facts. That is, no more than voice SSB, with a bandwidth of approximately 2.4 to 3.0 KHz is not suited for Amateur radio or should be deemed commercial. American and German Amateur radio operators⁴ developed all three Pactor protocols for use in the Amateur spectrum,"

Pactor III is a proprietary protocol developed by SCS GmbH & Co. KG.

The following statement may be found in the white paper by Hans-Peter Helfert and Thomas Rink of SCS providing the technical description of the Pactor II protocol:

"While PACTOR-I and -II were developed for operation within a bandwidth of 500 Hz, PACTOR-III is designed specifically for the commercial market to provide higher throughput and improved robustness utilizing a complete SSB channel."

The Pactor-III protocol was not designed with the paradigm of shared frequency spectrum in mind. It was designed with the paradigm of assigned,

dedicated commercial SSB channels in mind.

Remarks and requests by Mr. Waterman based on his obviously incorrect assumption should be disregarded.

"Mr. Miller refers to technical information that, according to its authors, has been taken out of context and is inaccurate,⁵ and attempts to manipulate his perspective. My contention is that regardless of any argument for or against current protocol development or the operations supporting it, past, present or future, without adequate bandwidth from which to operate, and with technical restrictions such as the limitations on symbol rates imposed, no development of high speed, 100 percent error corrected protocol development will occur."

Mr. Waterman provides no direct quotes of the authors he mentions which shows that anything has been taken out of context. Those authors have yet to file any comments on the petition directly stating that any of their test results or calculations are being misused. This is hearsay evidence and should, therefore, be given no credence.

There have been at least two new 100 percent error corrected protocols introduced to the amateur bands recently. One is the ALE400/ARQ FAE mode and the other is the PSKMail operation using a 125hz bandwidth psk mode. These modes are seeing significant experimentation on the ham bands.

There is apparently enough developers interested in providing new modes to the amateur community for HF operation that there **are** new modes being developed.

"Lastly, Mr. Miller suggests that those individual stations participating in the Winlink 2000 system are operating as commercial entities. As the Winlink 2000 Network administrator, I can assure the Commission that no such activities take place while being monitored by each station receiving traffic from users, worldwide. If such content is discovered, regardless of the country of origin or destination, it is dealt with promptly and sternly. Those using the interface between

radio and the Internet are no different than any other third-party non-realtime medium in Amateur radio."

This statement is very misleading. Operation as a commercial entity has nothing to do with the content of the data payloads being carried. In fact, part of the definition of a common carrier is that the contents the payload do not need to be known to the common carrier in order to be transported.

It is only amateur-to-3rd party communications via automatic internet gateway amateur stations that do not involve control operators of an amateur station on both ends of the transport. All traditional modes of 3rd party traffic involve control operators of amateur stations at both the originating and terminating ends of the transport. These are primarily traffic carried by the National Traffic System and by Packet radio transport.

The use of unattended, automatic internet gateway amateur stations to transport amateur-to-3rd party and 3rd party-to-3rd party traffic, sometimes with no amateur control operator involved in any portion of the transport of the traffic, is a new development on the amateur bands. Carriage of 3rd party-to-3rd party traffic with no amateur station control operator involved at any point in the transport is providing transport of data payloads in competition with commercial common carriers.

"Emergency Communications. During times of emergencies, for those stations using the Winlink 2000 system, the only real deterrent in successful operations has been the limitation of operating spectrum for the Pactor 3 protocol. This has a very negative effect on stations operating under local or remote control during times of emergencies. This is very real, and has been experienced greatly in recent domestic disasters, not only for critical operations, which admittedly can take place with some advanced notice and band planning under Sub-Part E of Part 97, but also for after-the-fact reporting of health and welfare. It also has a

major effect on attempts to handle individual emergencies where pre-planned Sub-Part E operations are not feasible. Emergency communications has become a major reason for using the capabilities of Pactor 3 and Winlink 2000. It is often the only thing left after an infrastructure has been destroyed or is otherwise unavailable. It has continuously proven itself successful in real-life casualty events, large and small."

The rules and regulations in Part 97.401, 97.403, and 97.405 are adequate to handle any emergency needs. These requirements should not be used to determine the requirements for regular, non-emergency operation in the amateur bands. Regular operations should be driven by spectrum efficiency metrics in order to provide the maximum utility to the entire amateur radio operator population.